Remarks

<u>Status of application</u>

Claims 1-40 were examined and stand rejected in view of prior art. The claims have been amended to further clarify Applicant's invention and more clearly distinguish Applicant's invention over the prior art. In consideration of the amendments to the claims and the below remarks, reexamination and reconsideration are respectfully requested.

<u>The invention</u>

Applicant's invention comprises a database system providing stored procedures as Web services. The system includes a lightweight HTTP server built directly into the database server and provides for opening up a communication port (e.g., HTTP) directly on the database engine itself (activated via a command line switch) for receiving client requests for Web services. The solution also includes a mapping feature that maps a given client request for a particular Web service to a particular stored procedure call(s). A developer authors the individual stored procedures that may be invoked in this manner. When a developer creates a particular Web service of interest, he or she specifies a particular stored procedure that is invoked (via a URL) to service client requests for that Web service. Therefore, with the underlying functionality provided by the system of the present invention, the developer has the flexibility to create any arbitrary number of Web services that he or she may desire. These Web services are supported directly by the database system, without requiring any middle-tier application server or other program logic external to the database system.

During system use, when a client request directed to a particular Web service is received at the database server, the built-in HTTP server translates the client request into a call for invoking the predefined stored procedures (complete with database features such as authentication, mapping, and the like) corresponding to the Web service being called. The result set that is generated from executing a particular stored procedure is then formatted appropriately (e.g., SOAP response, XML document, or HTML table as requested by the client) and returned back directly to the client.

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General

   A. Section 101 Rejection

   Claims 20 and 21-40 stand rejected under 35 U.S.C. 101 on the basis of non-statutory subject matter. As to claims 20 and 21, the Examiner states that Applicant's claimed system constitute software programs *per se* and hence are non-statutory. However, Applicant respectfully believes that the Examiner has incorrectly construed Applicant's specification as stating that the elements of Applicant's invention can only be implemented in software. In fact, Applicant's specification expressly states that the elements may be implemented in hardware, software or firmware (or combinations thereof). This is expressly stated, for example, at paragraph [0033] of Applicant's specification as follows: "...the corresponding apparatus element may be configured in hardware, software, firmware or combinations thereof" (Applicant's specification, paragraph [0033], emphasis added). Moreover, Applicant's specification describes in detail a computer hardware and software environment in which Applicant's invention may be implemented (Applicant's specification, paragraphs [0034]-[0044]). Also, Applicant states that the software (computer-executable instructions) direct operation of a device under processor control, such as a computer (Applicant's specification, paragraph [0120]). Although Applicant disagrees with the Examiner's characterization of Applicant's system as software *per se*, Applicant has amended claim 21 to more clearly indicate that the claimed invention comprises a useful machine or item of manufacture in terms of a hardware and software combination. Applicant has also made similar amendments to claim 20. In view of these amendments, Applicant respectfully believes that it defines a statutory product and overcomes the rejection of claims 20, and 21-40 under Section 101.

Prior art rejections

   A. Section 102 Rejection: Dreyfus

   Claims 1-8, 10-15, 18-28, 30-35 and 38-40 stand rejected under 35 U.S.C. 102(e) as being anticipated by Dreyfus et al. US Published Application 20060167829 (hereinafter "Dreyfus"). The Examiner's rejection of Applicant's claims 1 and 21 as follows is representative of the rejection of Applicant's claims as anticipated by Dreyfus:

Claims 1 and 21, Dreyfus teaches in a database system and method for providing
a stored procedure as a Web service, the method comprising:
predefining a stored procedure to be invoked upon receiving a client request for a
particular Web service (paragraph 93, 167, 175 and 208; paragraph 242);
receiving an incoming request from a particular client for the particular Web
service (fig. 3; paragraph 31;
in response to the incoming request, identifying the stored procedure that is
predefined for the particular Web service (paragraph 183; 128, 129);
executing the identified stored procedure for generating a result set (paragraph
242); and
returning the result set back to the particular client (paragraph 236).

Under Section 102, a claim is anticipated only if each and every element as set

forth in the claim is found, either expressly or inherently described, in the single prior art

reference. (See, e.g., MPEP Section 2131.) As will be shown below, Dreyfus fails to

teach each and every element set forth in Applicant's claims 1-8,10-15, 18-28, 30-35 and

38-40 (as well as other claims), and therefore fails to establish anticipation of the claimed

invention under Section 102.

At the outset, Applicant does not claim to have invented the notion of a three-tier

architecture in which a Web server (or application server) receives requests from client

devices and interacts with a back-end database server to obtain and serve up information

to the clients. At a high level, Applicant acknowledges that Dreyfus as well as numerous

other references describe three-tier systems of this general nature involving clients, a

middle-tier Web server (or application server) and a back-end database. However, this is

not Applicant's invention. Applicant's invention removes the need for a middle-tier Web

server (or other program logic external to the database server) by including a lightweight

HTTP server and supporting infrastructure for responding to client HTTP requests

directly into the database server itself (Applicant's specification, paragraphs [0061] -

[0063], Fig. 4). Applicant's claims have been amended to bring these features of

incorporating an HTTP server into the database system to the forefront.

With Applicant's invention Web clients communicate directly with the database

server without the need for an intermediary Web server or other external program logic.

As shown at Applicant's Fig. 4, client(s) 401 communicate directly with the database

server 410, which includes an HTTP server 431. When client requests are received at the

database server, the built-in HTTP server translates incoming client requests into stored procedure calls, complete with database features such as authentication (Applicant's specification, paragraph [0061]). The client requests are mapped to corresponding database stored procedures which have been previously defined and implemented. The solution converts client requests from HTTP into a format which can be used by the database engine and the stored procedure is executed (Applicant's specification, paragraph [0066]). The results from execution of the stored procedure are then formatted for return to the client (Applicant's specification, paragraph [0067]). For example, the results may be formatted as a SOAP response or an XML document (Applicant's specification, paragraph [0067]). The results are then returned to the client over the HTTP connection in the appropriate format.

These features are specifically included in Applicant's amended claims. For example, Applicant's claim 1 includes the following claim limitations:

> In a database system, a method for providing a stored procedure as a Web service, the method comprising:
> predefining a stored procedure to be invoked upon receiving a client request for a particular Web service;
> receiving an incoming request from a particular client for the particular Web service at an HTTP server incorporated into the database system;
> in response to the incoming request, identifying the stored procedure that is predefined for the particular Web service;
> executing the identified stored procedure for generating a result set; and
> returning the result set back to the particular client.

(Applicant's claim 1, emphasis added)

The Examiner states that Dreyfus includes a comparable teaching of an HTTP server built into the database system; however Dreyfus' solution relies on a Web server which is external to the database (Dreyfus, Fig. 3). As described at paragraphs [0186] - [0187] of Dreyfus, a Web server is included in a first tier which is separate from second tier which includes the database server. Moreover, Dreyfus's second tier includes both a database server and a "Java iSJS" server which "may be installed on different servers" (Dreyfus, paragraph [0187]). Dreyfus' iSJS server "plays the role of controller and regulator of network traffic, and also plays the role of gangway between enterprise database and Internet" (Dreyfus, paragraph [0187]). Thus, Dreyfus's solution relies on

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two components external to the database server: a Web server and a Java iSJS server (Dreyfus, paragraphs [0229] - [0232]). Accordingly, Dreyfus' approach requires users to set up a combination of a database, a Web server (external to the database), and an "iSJS" server (external to the database) to provide Web services.

Applicant's invention provides an integrated solution which includes support for Web services inside the database system itself. With Applicant's solution, users are not required to set up a variety of disparate components external to the database, but rather support for processing of Web services is integrated into the database system. As Dreyfus relies on Web server and Java server components external to the database server, it does not teach or suggest all of the claim limitations of Applicant's claims 1-8, 10-15, 18-28, 30-35 and 38-40 (and other claims) it is respectfully submitted that the claims distinguish over this reference and overcome any rejection under Section 102.

B. Section 103 Rejection: Dreyfus and Smith

Claims 9, 16-17, 29 and 36-37 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Dreyfus (above) in view of US Patent 7,013,469 to Smith et al. (hereinafter "Smith"). As to these claims, the Examiner relies on Dreyfus as substantially teaching the claimed invention, but acknowledges that Dreyfus fails to teach a URL including parameter information affecting how an identified stored procedure is executed. The Examiner adds Smith for these teachings.

Under Section 103(a), a patent may not be obtained if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. To establish a prima facie case of obviousness under this section, the Examiner must establish: (1) that there is some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings, (2) that there is a reasonable expectation of success, and (3) that the prior art reference (or references when combined) must teach or suggest all the claim limitations. (See e.g., MPEP 2142). As will be shown, the Dreyfus and Smith references, even when combined, fail to meet the requisite condition of teaching or

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suggesting all of Applicant's claim limitations.

Applicant's claims are believed to be allowable for at least the reasons cited above (as to the Section 102 rejection) pertaining to the deficiencies of Dreyfus as to Applicant's invention. Smith does not cure any of these deficiencies of Dreyfus as to Applicant's invention as Smith does not describe building support for Web services into a database server. Rather, Smith describes an environment which includes a middle-tier application server and/or other application logic external to the database server to serve as an intermediary between clients and the database server (Smith, Fig. 1; col. 4, lines 6-14).

In addition, although the teachings of Smith referenced by the Examiner refer to the URLs including parameter information, they do not make mention of a database stored procedures or, more particularly, of a database stored procedure which itself sets HTTP header information that is returned to the clients as provided, for example, in Applicant's claims 9 and 16. Applicant describes an approach in which, for example, a "place_order" stored procedure may require input of product identification numbers and size parameters (Applicant's specification, paragraphs [0111]-[0113]). Applicant's database server includes built in functionality for parsing an input HTTP request and using input parameter information obtained from the request in execution of a database stored procedure such as this "place_order" procedure (Applicant's specification, paragraphs [0122]-[0125]; paragraph [0129]). The Examiner references Smith at col. 27, lines 30-36 for the teaching of parameter information affecting how the identified stored procedure is executed. However, while referenced portion of Smith describes a "getobject" function which receives a URL input parameter, it does not describe that this information affects the execution of an identified database stored procedure as provided in Applicant's specification and claims.

Applicant also describes that the stored procedure may return (in addition to a result set) additional information for placement in the HTTP headers for return to the client (Applicant's specification, paragraphs [0132] and [0136]). This provides a mechanism for passing information from a given stored procedure back to the client, including returning output variables (parameters), cookies, or the like (Applicant's specification, paragraph [0136]). The Examiner references Smith at col. 773, lines 36-67

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for the corresponding teachings. However, the referenced teachings of Smith simply describe getting or setting cookies and make no mention of a database stored procedure -- or how database stored procedures built into a database server return output variables to the client without reliance upon program logic external to the database server.

All told, neither Dreyfus nor Smith teach a database server with built-in support for Web services, including parsing HTTP requests so as to obtain input parameters to database stored procedures and returning output variables to the client as described in Applicant's specification and claims. Thus, the Dreyfus and Smith references, even when combined, do not teach or suggest all the limitations of Applicant's claims. Accordingly, it is respectfully submitted that Applicant's claimed invention as set forth by these claims is distinguishable over the two references, and that the rejection under Section 103 is overcome.

Any dependent claims not explicitly discussed are believed to be allowable by virtue of dependency from Applicant's independent claims, as discussed in detail above.

Conclusion

In view of the foregoing remarks and the amendment to the claims, it is believed that all claims are now in condition for allowance. Hence, it is respectfully requested that the application be passed to issue at an early date.

If for any reason the Examiner feels that a telephone conference would in any way expedite prosecution of the subject application, the Examiner is invited to telephone the undersigned at 925 465 0361.

Respectfully submitted,

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